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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|------------------------------|---------------------|------------------------|
| 10/512,129 | 10/13/2004 | Victor Alexandrovich Kalinin | 148-27 | 6850 |
| 24336 | 7590 | 10/19/2005 | EXAMINER | |
| KEUSEY, TUTUNJIAN & BITETTO, P.C. 14 VANDERVERENTER AVENUE, SUITE 128 PORT WASHINGTON, NY 11050 | | | | SAINT SURIN, JACQUES M |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2856 | |

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/512,129 | KALININ, VICTOR ALEXANDROVICH ET AL. <i>(Signature)</i> | |
| | Examiner | Art Unit | |
| | Jacques M. Saint-Surin | 2856 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 13 May 2004.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1,3-8 and 10-20 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1,3-8 and 10-20 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 13 May 2004 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>5/13/04</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claim 1-8 and 10-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
2. Claim 1 recites "said oscillator" in line 8. There is insufficient antecedent basis for this limitation in the claim. In addition, the claim recites "a variable frequency" in lines 3 and 9. It is not clear if it is referring to the same variable frequency or a different one. Clarification and Correction are required.

Claim 8 recites "a variable frequency oscillator" in line 2 and "a variable frequency" in lines 3, 16 and 18. In addition, the phrase "thereby leaving just an amplitude" recited in claim 10 and "so as to leave just an amplitude" recited in claim 14, line are not a positive limitation.

3. The claims are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 3-5, 8,10-12 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lonsdale et al. (US Patent 6,467,351) in view of Wolff et al. (SAW Sensors for Harsh Environments XP-00229479).

Regarding claims 1, 3, 8 and 10-11, Lonsdale discloses an apparatus for tracking the varying resonant frequency of an electrically resonant structure, characterised in that it comprises a variable frequency oscillator providing an excitation signal of a variable frequency encompassing the possible resonant frequency range of said resonant structure, a bidirectional RF transmission line connecting said variable frequency oscillator and said resonant structure, a directional coupler incorporated in the transmission line which generates a directional coupler signal proportional to the reflected signal from said resonant structure, said directional coupler signal being conditioned by a processor to provide a feedback signal to the input of the variable frequency oscillator, such that the mean frequency of said excitation signal is caused to continuously track the varying resonant frequency of said resonant structure (see: col.1, lines 43-57. Lonsdale further shows in Fig. 4, two electrically resonant structures 24 and 29 are mounted on a surface 6 such that when the surface 6 is strained in a given direction, a differential strain is applied to each of structures 24 and 29. Each structure 24, 29 is electrically connected to tracking apparatuses via bidirectional RF transmission lines 23, 28 respectively, which incorporate directional couplers 25, 30 respectively. The tracking apparatuses consist of VFOs 22, 27 respectively and processors 31, 26 respectively. The output of directional couplers 25, 30 are connected to the input of processors 31,26 respectively. The operation of processors 31, 26 is as

discussed earlier for processor 5, with the addition of synchronising signal 41 linking processors 31 and 26. The purpose of synchronising signal 41 is to link the master frequency sources of both processors 31 and 26. The outputs of VFOs 22 and 27 are input to mixer 32 with two outputs. The first output is the difference in frequency between the excitation signals of the two VFOs 22 and 27, and the second output is the sum of the frequencies of the excitation signals of the two VFOs 22 and 27. However, Lonsdale does not disclose or suggest filtering the response and reference signals to remove the sum products from the composite signal. Wolff shows in Fig. 2a a low pass filter connected to an output of a mixer mixing signals of a sensor and, a reference from an oscillator. It would have been obvious to one having ordinary skill in the art to utilize in Lonsdale the techniques of Wolff because it would provide effectively the filtering functions to the mixed signals by removing the unnecessary or undesired signals in an efficient manner thereby, making the above combination more reliable.

Regarding claim 3, as discussed above, the combination of Lonsdale in view of Wolff shows a low pass filter in Fig. 2a.

Regarding claims 4-5, Lonsdale discloses the change in impedance of structure 2 can be utilised to measure various physical quantities of interest. The physical quantity being measured may for example be strain imparted to structure 2 due to the straining of a surface 6 to which structure 2 is substantially rigidly mounted. Strain of this surface 6 may, for example, be caused by physical quantities such as an applied load, applied bending moment, pressure or temperature causing thermal expansion of the surface 6. Alternatively change in impedance of structure 2 may be

caused directly by mass loading of structure 2 due to absorption of fluids resulting from changes in humidity or presence of specific fluids, see: col. 6, lines 30-42.

Regarding claim 8, it is similar in scope with claim 1 and therefore, it is rejected for the reasons set forth for that claim. Furthermore, Lonsdale discloses FIG. 3 shows an embodiment with additions to processor 5 shown in FIG. 2 which will enable a search function to be carried out. The components which make up processor 5 remain the same as that shown in FIG. 2. Additions to the circuit comprise frequency source 19 to provide a search frequency ($f_{sub.2}$) of a value substantially lower than the master frequency, a voltage reference source 22, a comparator 21 and a change over switch 20 operated by the output of comparator 21. When the frequency of the excitation signal supplied by VFO 1 is substantially different from the resonant frequency of structure 2, the output of synchronous rectifier 14 will be a comparatively large DC voltage. This output is supplied to one input of comparator 21, the other input being supplied by reference voltage ($V_{sub.ref}$) from source 22. If the output voltage of synchronous rectifier 14 is larger than this reference voltage, comparator 21 activates changeover switch 20 which disconnects the input of integrator 16 from synchronous rectifier 14 and connects it to frequency source 19. In this mode, the output of integrator 16 sweeps from a minimum value to a maximum value and back continuously, see: col. 5, lines 1-21.

Regarding claim 10, Lonsdale shows in Fig. 4 first and second resonant structures (24, 29) are connected in parallel.

Regarding claim 11, Lonsdale discloses the output of integrator 16 is then supplied to summer 17 which has a second input supplied by master frequency source E15, see: col. 4, lines 49-51.

Regarding claim 12, it is similar in scope with claim 3, therefore, it is rejected for the reasons set forth for claim 3.

Regarding claim 20, Lonsdale discloses in-line couplers 8 between VFO's 22 and 27 and respectively, structures 24 and 29. This provides for non contact measurement of the resonant frequencies of structures 24 and 29 if they were mounted for example, on a rotating shaft, see: col. 5, lines 61-67.

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lonsdale et al. (US Patent 6,467,351) in view of Wolff (XP-002294979) and further in view of Lehman et al. (US Patent 6,433,541).

Regarding claim 13, Lehman in view of Wolff does not disclose an impedance connected between the oscillators and the coupling device. Lehman shows in Fig. An impedance bridge coupled with differential probe coils. The impedance bridge is also coupled with a synchronous detection block 250, see: col. 6, lines 16-18. It would have been obvious to one having ordinary skill in the art at the time of the invention to include in the combination of Lonsdale in view of Wolff the impedance bridge of Lehman because it would provide means for measuring effective the I and Q difference values of the oscillators which are also driven by the frequency source in a reliable manner, thereby making the above combination more effective.

Allowable Subject Matter

7. Claims 6-7 and 14-19 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacques M. Saint-Surin whose telephone number is (571) 272-2206. The examiner can normally be reached on Mondays through Fridays 10:30 A.M. -7:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272 2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JMF
Jacques M. Saint-Surin
October 13, 2005

Hezron S. Williams
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